Release Notes

HP StorageWorks Secure Path V3.0D for Sun Solaris

Product Version: 3.0D

Fourteenth Edition (July 2004)

Part Number: T3035–98201

This document summarizes features and characteristics of HP StorageWorks Secure Path V3.0D for Sun Solaris systems.

For the latest version of these Release Notes and other Secure Path documentation, access the HP storage web site at: http://www.hp.com/country/us/eng/prodserv/storage.html.

Secure Path V3.0D for Sun Solaris Release Notes
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Release notes information

These section cover the following major topics:

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Intended audience

This document is intended for customers who are updating to StorageWorks Secure Path v3.0D for Sun Solaris and who are responsible for installing, configuring, and maintaining this product in their Sun Solaris server environment with any one of the following StorageWorks RAID Arrays:

- RA8000/ESA12000 (HSG80)
- MA8000/EMA12000 (HSG80)
- EMA16000 (HSG80)
- EVA5000 (HSV110)
- EVA3000 (HSV100)

This document assumes that you are familiar with Sun Solaris system administration, including hardware and software installation.

Secure Path kit contents

The Secure Path v3.0D for Sun Solaris kit includes:

- Secure Path v3.0D software
- Secure Path v3.0D Read Me First Document
- *HP StorageWorks Secure Path v3.0D for Sun Solaris Installation and Reference Guide,* part number AA-RKYDK-TE.
- *HP StorageWorks Secure Path v3.0D for Sun Solaris Release Notes*, part number T3035-98201 (this document)

Additional documentation, including white papers and best practices documents, is available on the HP web site at:
http://www.hp.com/country/us/eng/prodserv/storage.html

New in this release

Secure Path v3.0D for Sun Solaris adds new functionality and addresses the following issues found in the v3.0C Service Pack 1 release.

Secure Path v3.0D for Sun Solaris new functionality

The following bullets list new functionality in Secure Path v3.0D:

- Significant parts of the HSG80 and EVA5000/EVA3000 platform kit have been integrated into this kit so that the install requires only the Secure Path v3.0D for Sun Solaris kit and *does not require* a separate platform kit.
- The addition of the HSG80 and EVA5000/EVA3000 platform kit components to Secure Path v3.0D for Sun Solaris has raised the size of the installation bundle to 27 MB. Therefore, HP provides a 10.3 MB compressed `tar` bundle in the web upgrade kit.
- The `install_SP` script (found in the installation bundle `solaris` directory) is run to either *newly install or upgrade* all valid versions of HBA drivers and Secure Path.
- The `/opt/HPfcraid` directory is now used for all newly installed platform components. Note that this does not replace the installed `/opt/CPQhsv` or `/opt/steam` directory.
- The `config.sh` script is included in the `/opt/HPfcraid/bin` directory. This script can be used for adding new arrays, HBAs and HBA ports after the initial install configuration.

- The `sssu` and `swcc` utilities are *not* part of this kit and can be accessed at:
  - For the sssu utility: http://h18006.www1.hp.com/products/storageworks/softwaredrivers/enterprise/index.html
  - For the swcc utility: http://h18006.www1.hp.com/products/storageworks/ma8kema12k/kits.html.

Note: The swcc utility is part of the Solaris 8.7B Platform Kit for HSG80.

- Secure Path now uses the `ssd` driver instead of the `sd` driver.
- A mounted or open LUN can not be deleted using `spmgr delete` commands and you can not quiesce the last available path of a mounted or open LUN using the `spmgr quiesce` commands.
- Use of `devfsadm` after `spmgr delete` is no longer required on Solaris 7, 8, and 9.
- DS-SWSA4-xC (JNI) 2.6.13 driver upgrade for Solaris 9 support.
- FCA2257x (Qlogic) 4.13.01 driver upgrade.
- Greater than 1 TB LUN support on Solaris 9.
- Command `spmgr display` options `–av, -av` <*HBA*> and –a <*HBA*> include an added field, `Optional ROM:` which lists the HBA Fcode version if that data is available from the HBA.
- The required Solaris patch list has been updated to current patch revisions. Secure Path man pages have been updated.

Fixes in Secure Path v3.0D

The following section lists problems that have been fixed in Secure Path v3.0D:

- the `spconfig` utility puts duplicate entries in `hsx.conf` resulting in install performance issues.
- LUNs disappearing on upgrade to 3.0C
- The `K36spinit kill` script hangs at shutdown
- The `spmgr select` command puts incorrect entries in `hsx.conf` resulting in performance issues
- The `spmgr display` command takes greater than 20 minutes to display if LUNs with failed paths are in `spmgr display -u.`
- The `spagent` or `spconfig` utility leaks memory and has data integrity issues.
- DR spmgr crash on UE10K.
- Using the `spmgr quiesce` command during a path verification resulted in a long delay and a `quiesce` command failure.
- The `spmgr select -p <stdby_path>` command with load balancing displays a `invalid arg` error but succeeds.
- The `spmgr add` or `spmgr delete` command results in a mutex deadlock panic under heavy load,
- the `spmgr display -u` command not updating WWLUNIDs to reflect presentation changes (deleting a LUN at the array and presenting a new LUN at the same `Vdisk` number).
- Incorrectly parsing the HBA name in `/etc/path_to_inst` if the server has greater than 10 HBAs.
- spconfig run time much longer if adding a new HBA or array
- spagent core dump during pkgrm part of upgrade
- swsp and hsx driver re-entrant mutex issue in path verification and display IOCTLs
- pkgrm of CPQswsp fails if VxVM devices are in error or offline states
- request sense command not getting the full status buffer copied resulting in a system panic
- Improved parser error handling for illegal `spmgr alias` arguments
- An HSG80 disabled snapshot results in an infinite loop hang on boot

- VERITAS VxVM doesn't detect failed stripe set on an HSG80 stripe set mirror
- The `spmgr display -av <HBA>` displays `WWPN: unknown` if more than 512 paths presented per HBA type.
- Sun Patch 111097 (Sol 8) or 113042 (Sol 9) causing the Sun QLC driver to bind to the FCA2257x HBA.

Operating system support

Secure Path v3.0D for Sun Solaris software and hardware are listed in Table 1.

Table 1: Secure Path—supported hardware and software

Host Feature	Requirement
Platform	Sun Sparc
Operating System	Solaris 9, Solaris 8, Solaris 7, Solaris 2.6
Kernel Mode	32-bit, 64-bit
Sun Hardware	Sun4u Architecture only
RAID Storage Systems	StorageWorks Enterprise Virtual Array with VCS versions v2.006, v3.001, v3.010, v3.014 or v3.020. RA8000/ESA12000, MA8000/EMA12000, or EMA16000. HSG80 configurations require dual controllers and ACS v8.6 or v8.7
Solution Software Kit	StorageWorks Solution Software for Sun Solaris, v8.6b (CPQfcraid 2.5B) StorageWorks Solution Software for Sun Solaris, v8.7 (CPQfcraid 2.5B) Enterprise Virtual Array Software for Sun Solaris, v2.0 (CPQhsv v2B) Enterprise Virtual Array Software for Sun Solaris, v3.0B (CPQhsv v3B)
Host Bus Adapters	DS-SWSA4-PC 32-bit PCI, single 1-Gbit ports, HBA driver Version 2.6.13, Firmware Version 3.0.3 DS-SWSA4-SC 64-bit Sbus, single 1-Gbit ports, HBA driver Version 2.6.13, Firmware Version 13.3.7 FCA2257S 64-bit Sbus, dual 1-Gbit ports, HBA driver Version 4.13.01, Firmware Version 2.2.6, F-Code Version 2.00.03 FCA2257C 64-bit cPCI, dual 1-Gbit ports, HBA driver Version 4.13.01, Firmware Version 2.2.6, F-Code Version 2.00.05 FCA2257P 64-bit PCI, single 2-Gbit port, HBA driver Version 4.13.01, Firmware Version 3.2.15, F-Code Version 2.00.05

Table 1: Secure Path—supported hardware and software (Continued)

Host Feature	Requirement
Required Patches	**Solaris 2.6:** 112542-01, 106125-16, 105181-35, 106226-03, 105356-23, 105210-51, 107665-01, 105568-26 **Solaris 2.6 Ultra Enterprise 10000 system:** 106284-07, 109334-03, 106381-06 (These patches are required for this system in addition to those listed for Solaris 2.6.) **Solaris 7:** 107834-04, 107544-03, 106541-30, 106950-24, 106327-20 **Solaris 7 Ultra Enterprise 10000 system:** 107450-04 (This patch is required for this system in addition to those listed for Solaris 7.) **Solaris 8:** 116602-01, 115827-01, 113648-03, 111317-05, 111023-03, 110386-03, 108989-02, 112396-02, 110912-04, 111310-01, 111111-03, 108987-13, 108528-27, 109793-23, 108993-31, 109147-27, 108434-13, 108435-13 **Solaris 8 Ultra Enterprise 10000 system:** 110389-05, 110794-05, 111049-03 (These patches are required for this system in addition to those listed for Solaris 8.) **Solaris 8 Sun Fire 15000 system:** 110830-02, 110831-02, 110837-05, 110836-05, 110826-09, 110838-06, 111335-18 (These patches are required for this system in addition to those listed for Solaris 8.) **Solaris 9:** 114129-01, 114127-02, 114369-01, 113072-07, 114132-01, 114131-01, 113049-01, 112233-11, 112834-03, 113277-17, 114128-01, 113981-02, 114389-02, 113454-14, 113073-05, 112966-03, 113457-05, 115018-01, 115020-01, 114721-04, 115022-02, 115024-01, 115026-01, 113993-06, 113492-04, 115030-01

Note: Running ACS v8.6 or 8.7, the system must have:

- Hardware revision E08 or later HSG80 controller modules.
- A minimum of 128 MB of cache; if mirrored cache is enabled, an additional 128 MB of cache per controller is required.

Refer to the ACS Solution Software for HSG80 release notes for details.

Fibre Channel configurations

Refer to the *HP StorageWorks SAN Design Reference Guide* for configuration information about HBAs and Fibre Channel switch support. This document is available on the HP web site at http://h18004.www1.hp.com/products/storageworks/san/documentation.html.

Configuration limitations

Table 2 shows the configuration limits for Secure Path on Sun Solaris

Table 2: Configuration limitations

Parameter	Minimum	Max Qualified	Max Supported
Host Bus Adapter support	1	8	16 HBAs per controller pair
Storage arrays per host	1	8	128

Third-party software

Installing HBA SNIA libraries

The vendor supplied SNIA libraries for JNI and Qlogic HBAs are included in the Secure Path v3.0D installation bundle. These may be used or required by applications such as OVSAM. The packages are included in the top directory (*solaris*) of the Secure Path installation CD-ROM or CPQswsp_30d_update.tar.Z. The package, names & versions and installed directory are listed below. Use the command `pkgadd -d.<Package>` to the install the required library.

Note: The SNIA Library version must match the HBA driver version or serious system problems may occur. If your system has an existing SNIA library, you must remove it prior to the HBA driver installation, then install the SNIA library that was supplied with the Secure Path V3.0D installation bundle following the Secure Path installation procedure.

Table 3:

Package	Name & version	Installed directory
JNIsnia	JNI SNIA Fibre Channel HBA LIBRARY (Solaris) v2.0.b.030108-14	`/opt/JNIsnia`
QLSDMLIB	QLogic SDM Library for SNIA 1.0 Solaris 7-8-9, Rev=3.05	`/usr/lib`
QLSDMLIB6	QLogic SDM Library for SNIA 1.0 Solaris 2.6, Rev=3.05	`/usr/lib`

VERITAS software supported

The following VERITAS software is supported with Secure Path v3.0D under Solaris 2.6, 2.7, 2.8, and 2.9:

- VXFS, versions 3.4 and 3.5
- VM, versions 3.2 and 3.5
- VCS, version 3.5

Note: When using VERITAS Volume Manager, you must disable Dynamic Multipathing (DMP) for all storage systems supported by Secure Path.

Disabling DMP on VERITAS Volume Manager v3.1.1 and Later

To disable the DMP driver in VERITAS Volume Manager (VxVM) v3.1.1 and later, use the following steps:

1. Launch the `vx` disk administrator with the following command:

   ```
   vxdiskadm
   ```

2. Choose **Prevent multipathing/Suppress devices from VxVM's view**.
3. Enter **y** at the prompt to continue.
4. Choose **Prevent multipathing of all disks on a controller by VxVM.**
5. Enter `list` to view controllers that Volume Manager has access to.
6. Enter the controllers that are being used by Secure Path. For example, enter *c7* to exclude all LUNs on *c7* from DMP control.
7. Enter **q** to quit from the DMP administrator.
8. Enter **q** to quit from the vx disk administrator.

Troubleshooting Secure Path

Table 4 defines the way that an *event* such as a failure or state change is reported to the server through the Secure Path driver *(*`hsx`*)* or agent *(*`spagent`*)*. The "Response Action" column shows where the event is logged. LOG is the `/var/adm/messages` file, CONSOLE is the root console, and NOTIFY is e-mail notification. The "Level" column indicates the criticality of the event and is used by the Secure Path Manager *(*`spmgr`*)* to allow the system administrator to route events to specific users. The levels are further defined in the *StorageWorks Secure Path V3.0D for Sun Solaris Installation and Reference Guide*.

Table 4: Responses and severity levels for supported events

Event	Response Action	Level
Path failed	LOG+CONSOLE+ NOTIFY	WARNING
Failover condition detected	LOG+CONSOLE+ NOTIFY	CRITICAL
Failover start	LOG+CONSOLE+ NOTIFY	INFORMATIONAL
Failover complete	LOG+CONSOLE+ NOTIFY	INFORMATIONAL
Failover failed	LOG+CONSOLE+NOTIFY	WARNING
Restore start	LOG+CONSOLE+ NOTIFY	INFORMATIONAL
Restore complete	LOG+CONSOLE+ NOTIFY	INFORMATIONAL
Restore failed	LOG+CONSOLE+NOTIFY	WARNING
Excessive restores	LOG+CONSOLE+NOTIFY	WARNING - auto restore has been disabled until next time quantum (1 hour)
Availability changed	LOG+CONSOLE+ NOTIFY	CRITICAL
Select complete	LOG+CONSOLE+ NOTIFY	INFORMATIONAL
Select failed	LOG+CONSOLE+ NOTIFY	WARNING
Unit attention	LOG	INFORMATIONAL
Select start	LOG+CONSOLE+NOTIFY	INFORMATIONAL

Avoiding problem situations

The following sections list problems that may arise during Secure Path operation and tells you how to avoid those problems.

Secure Path v3.0D

This section identifies problems that are new with Secure Path v3.0D for Sun Solaris.

Spconfig fails to configure an HSG80 on heavily loaded SAN

The `spconfig` utility may fail and exit while trying to configure an HSG80 based array with the following message:

```
Error: 5 ScsiSendDiag():Failed ssc_scsi_stat=0 send status = -1
sent command show this
```

This failure can be resolved by rerunning `spconfig` at a time when the SAN is less loaded or by using the following procedure:

1. Reboot the server after seeing the error.
2. Run `spmgr display` to determine which array was not configured.
3. Use the procedure found in Appendix A "Adding an Array to an Existing Configuration" in the *HP StorageWorks Secure Path V3.0D for Sun Solaris Installation and Reference Guide* to add the unconfigured array.

Business Copy EVA v3.0 is required

Business Copy EVA v3.0 is required with Secure Path v3.0D to undo snapshot jobs.

Adding a LUN with the same WWLUNID

To add a LUN that has the same WWLUNID as a configured LUN on a different array (for example, using Continuous Access EVA), you must use `spmgr add-r <WWNN> all.`

Operating system upgrade from Solaris 2.6

Operating system upgrades from Solaris 2.6 to either Solaris 7, 8 or 9 require a reinstallation of Secure Path v3.0D due to modified entries in `/kernel/drv/ssd.conf.`

Deleting all LUNs with Solaris 2.6

The command `spmgr delete -r <WWNN> all` is not supported on Solaris 2.6. If the command is used and the server is rebooted, the array specified must be readded using the procedure in Appendix A in the *HP StorageWorks Secure Path v3.0D for Sun Solaris Installation and Reference Guide.*

Deleting all LUNs with Solaris 7, 8, and 9

The command `spmgr delete -r <WWNN> all` can be used to delete all LUNs of an array on servers running Solaris 7, 8, or 9. The LUNs are added to the unclaimed list and can be displayed using the `spmgr display -u` command. However, if this is the only array and the server is rebooting following the LUN deletion, the array and its LUNs will not be detected following the reboot. To redetect the array and LUNs, run the command `devfsadm` followed by `spmgr display -u`.

Deleting two LUNs that have identical WWLUNIDs

Some applications, such as Continuous Access, require presenting LUNs from different EVA storage systems to the same server with identical WWLUNIDs. When these LUNs are deleted using `spmgr delete WWLUNID,` the first LUN in `spmgr display` is deleted and placed in the unclaimed list `(spmgr display -u)` but the second LUN remains in `spmgr display` as quiesced.

To successfully delete both LUNs, unpresent the first LUN at the array (the one in `spmgr display -u`), delete the remaining LUN using `spmgr delete WWLUNID` and unpresent that LUN at the array. This sequence deletes both LUNs and leaves no Secure Path remnants.

WWPN not displayed on Solaris 2.6

The commands `spmgr display -av <HBA>` and `spmgr display -dv <device>` may display as `WWPN: (blank)` on Solaris 2.6 or all 32 bit kernels using DS-SWSA4 (JNI) HBAs. The WWPNs is displayed by running `/opt/HPfcraid/bin/config.sh`. Choose **Option 5: View available WWPNs**.

Downgrading Secure Path

Downgrading to a lower version of Secure Path from v3.0D is not supported. Configuration files that were added and/or modified by Secure Path v3.0D are not backward compatible with previous versions.

General Notes

This section discusses problems that occur in a number of different areas throughout the system.

Load Balancing with Sun Clusters

Load balancing is not supported with Sun Cluster 2.2, 3.0 or 3.1 with less than 3 nodes. Do not enable Load balancing while using two node Sun Clusters.

Quiesced paths not displaying as Preferred

If a preferred path is quiesced (`spmgr quiesce -p <path instance>`), the path no longer displays as preferred

Active path shown as Available

The `spmgr display` command may show the Active path as Available if that path has not been touched prior to the `display` command. The easiest way to touch all LUNs and resolve this is to first run the `format` command.

Array shutdown

If a storage array must be shutdown, run the command `spmgr quiesce -c <controller_ser_num>` for both controllers in the array before shutting down the array. Failure to follow this order will result in excessive and continuous system error messages.

Anti-thrash filter

Secure Path has an anti-thrash filter that prevents LUNs from thrashing back and forth between controllers under some circumstances. Once a LUN's path has been restored by the `auto-restored` option twice within one hour, the filter prevents further restore activity for one hour. When this occurs, the following message is displayed on the console and logged in the system log:

```
Auto restore for LUN 6000-1FE1-000F-CA60-0009-1150-2081-009F
has been disabled until the next time quantum (1 hour)
```

Required patches

With the Secure Path v3.0D release, the Secure Path installation verifies that the required patches are loaded during installation. The system administrator is responsible for ensuring that all required patches are loaded before installing Secure Path.

If the required patches are not installed, you are given the option of continuing the installation without the patches loaded. To avoid unsupported configurations and other possible problems, ensure that all patches are loaded for normal operation. Required patches are listed in Table 1 on page 8 of this document.

If you are running a 32-bit kernel, you can safely ignore any 64-bit patch requirements when prompted to install these patches.

Path locked message during reboot

During reboot, when `spinit` is executing, you will see the following notice message:

```
NOTICE: Path hsx-6-34-6 locked, must be quiesced prior to detach
```

This message can be safely ignored.

Path hsx-6-34-6 locked

If you see the following message repeatedly scrolling on your console, your system is heavily loaded.

```
Path hsx-6-34-6 locked, must be quiesced prior to detach
```

When under heavy load, Solaris attempts to unload all kernel modules to free up resources. Secure Path displays this message every time Solaris attempts to unload any of its drivers.

If this happens, you must add system resources or remove some of the load. Your server should not be operating under these conditions.

Fault in private data messages during reboot

During a reboot and at other times, you will see the following warning:

```
WARNING: devinfo: fault in private data at 30000xxxxxx
```

This message can be safely ignored.

Deleting LUNs

- LUNS must be deleted from Secure Path control, using `spmgr delete`, before they are deleted or unpresented from the storage system. Failure to do this will result in Secure Path LUNs that cannot be deleted.
- Do not delete all LUNs on a storage system. This will result in the Secure Path drivers being unable to communicate with the storage system.
- When entering `spmgr add` or `spmgr delete` commands, you may get the following error message:

  ```
  Error: Could not properly write config file.

  Check `/kernel/drv/hsx.conf' and '/kernel/drv/swsp.conf' for
  errors.
  ```

  This indicates that there is a WWLUNID mismatch between what the Secure Path driver sees and what is in the Secure Path configuration files. This is usually caused by deleting or changing a LUN on the storage system and rebooting the server, without changing the Secure Path setup. Secure Path expects a particular WWLUNID at a particular target LUN.

  The most common causes are trying to:

  — Add a WWLUNID to Secure Path more than once.

  — Delete a WWLUNID that has been changed at the array.

  — Add a WWLUNID to a target LUN that is already in use.

  To prevent this from happening:

  — Never attempt to add the same WWLUNID more than once.

  — Always delete a LUN from Secure Path control before deleting it on the storage.

  — Always delete a LUN from Secure Path control before changing the LUN on the array (changes the WWLUNID).

  — If you're not sure of the next available target LUN to use to add a LUN, let Secure Path pick the target LUN (default behavior).

  If you get this error message, run `spmgr update` to automatically update the `/kernel/drv/swsp.conf` file. Verify that only the WWLUNIDs that are actually presented to your server are entered in this file, and that any WWLUNIDs that are no longer available are removed. Refer to the `swsp.conf` man page for more information.

Array removal

If an array is inadvertently disconnected from a server running Secure Path, it fails to reschedule the system's watchdog timer. This results in being unable to re-establish communication with the array following reconnection of the array. The timer can be restarted by quiescing any known array object (adapter, controller, or path) using `spmgr quiesce` followed by `spmgr restart all`.

Removing an HSG80 disk

If a configured disk is physically removed from an HSG80-based array, a specific SCSI unit attention is broadcast to all LUNs on all paths. Secure Path interprets this as a path failure event in which all paths to all LUNs are momentarily failed. The *last gasp* logic immediately corrects the condition on all good LUNs, and I/O is only blocked for less than a second. Secure Path's event notification logs all of these events. To prevent this situation, be sure to delete any device from the array before removing it.

ACS 8.7S parent WWLUNID

The ACS 8.7S feature that allows creation of a snapshot or clone using its parent WWLUNID resulting in two devices with the same WWLUNID, is not supported by Secure Path. Attempting to manage these devices with `spmgr` results in potential confusion between the units.

Clustering with Solaris 2.6

When using Sun Cluster 2.2 with Solaris 2.6, you may get the following error message when you attempt to run `spmgr` commands:

```
Error: This host is not authorized to connect to remote host.
```

This occurs because `spagent` is using the actual server host name for authentication, rather than the cluster host name.

To fix this problem, add the cluster name as an authorized client by using the `spmgr client add <cluster_name>` command.

Dynamic reconfiguration with Solaris 2.6

Dynamic Reconfiguration (DR) is not supported with Secure Path v3.0D on servers running Solaris 2.6.

Removing Secure Path While LUNs Are Under SVM Control

The Secure Path pre-remove script examines the /kernal/drv/md.cf file. If any devices are listed in the file, you can not remove secure path. To successfully remove Secure Path in an non_Sun cluster environment with secure path LUNs under Solaris Volume Manager Control (SVM), you must remove all local Secure Path devices from SVM control prior to removing secure path;or temporarily rename the /kernal/drv/md.cf file prior to removing Secure Path, then rename the temporary file back to /kernal/drv/md.cf file after secure path is removed.

Failed RAID0 LUN on EVA Causes Continuous Controller Failover Failback

A failed disk in an EVA RAID0 storage set will not be detected as a failed device by Secure Path. The underlying symptom is that incorrect signaling between the HSV controller and Secure Path is resulting in continuous failovers and failbacks between the controllers which are noted in the `/var/adm/messages` file. I/O is blocked as it should be with a RAID0 failure.

To resolve this failure, replace the failed disk in the RAID0 set and restore the data to the virtual device.

Spmgr Notes

- Because `spmgr` uses TCP/IP sockets for communication with `spagent`, network services must be configured and functioning properly for `spmgr` to start. However, this does not affect the failover capabilities of the Secure Path drivers.
- Rebooting with a known failed path results in losing all knowledge of that path. For example, start with an initial condition of four paths to a LUN with three alive paths and one dead path, as seen with `spmgr display`. Reboot the system. `Spmgr display` then sees only three alive paths. A subsequent repair of the path followed by running `drvconfig` allows `spmgr` to find the path again, but `spmgr notify` has no record of a repair event.
- The `spmgr display` command occasionally reports the HBA in it's un-aliased form (for example: *pci1077,9*). The kernel stores the HBA alias in `/etc/driver_aliases` and when Secure Path requests the HBA from the kernel, the kernel occasionally doesn't succeed with the lookup. If you receive an unknown HBA response in this un-aliased form, `grep` for the string in `/etc/driver_aliases` to determine the HBA name.